

CHM 5226
ORGANIC REACTIONS
Fall 2006

Gregory B. Dudley
gdudley@chem.fsu.edu
Office: 604 DLC
MWF, 8:00–8:50AM
213 HTL

Office Hours: MWF, 9–10AM, or walk-in
Arrow Pushing Sessions: Saturdays, 10AM–12PM, as announced

Course Objective: To provide you with the knowledge of general tactics in organic synthesis to allow future design and execution of synthetic strategies.

Grading:

2 tests (100 pts each), 1 final exam (200 pts), plus homework

Exams:

Cumulative, and they assume a thorough understanding of undergraduate organic chemistry. However, specific exams will focus on the most recent material.

Textbooks:

Required: Carey and Sundberg “Advanced Organic Chemistry” Part B, 4th Edition, 2001
Kürti and Czakó “Strategic Applications of Named Reactions in Organic Synthesis” 2005

Recommended: C&S “Advanced Organic Chemistry” Part A, 4th Edition, 2000
R. B. Grossman “The Art of Writing Reasonable Organic Reaction Mechanisms”
Re-read your undergraduate organic textbook!

Molecular Models:

Recommended: HGS Models, Biochemistry 5000 Series, Bio-organic Set, 264 pieces
<http://www.maruzenusa.com/>

Topics: (associated reading assignments in **bold**)

1. Diels-Alder reaction and Review (**C&S 6.1, 3, 4.1–4.3, 4.8**) *4 lectures*
 - a. Best reaction ever!
2. Oxidations (**C&S 4.4–4.7, 12**) *5 lectures*
 - a. Oxidation of alcohols
 - b. Epoxidation of olefins
 - c. Dihydroxylation of olefins
 - d. Miscellaneous oxidations
 - e. C–H activation

3. Reductions (**C&S 4.9, 5**) 3 lectures
 - a. Hydrogenation and hydrogenolysis
 - b. Hydride reagents
 - c. Hydroboration of olefins

Test #1 Oct 4, 2006 (on or about)

4. Reactions of carbonyls with nucleophiles (**C&S 7, 9, 2.3–2.7**) 6 lectures
 - a. Metallation reactions
 - b. Nucleophilic addition to carbonyls
 - c. Olefination of carbonyls
5. Reactions of carbonyls with electrophiles (**C&S 1, 2.1–2.2**) 5 lectures
 - a. Formation of enolates
 - b. Enolate alkylation
 - c. Aldol reactions
 - d. Miscellaneous
6. Organometallic Chemistry (**C&S 8**) 4 lectures
 - a. Palladium-catalyzed coupling (and related procedures)
 - b. Other important reactions
 - c. Olefin metathesis

Test #2 Nov 15, 2006 (on or about)

7. Carbocations, radicals, and carbenes (**C&S 10, 11**) 4 lectures
 - a. Cation- π cyclizations
 - b. Aromatic substitution
 - c. Carbenes
 - d. Radical reactions
8. Organocuprate conjugate additions 1 lecture
 - a. So they add 1,4... what else is new?
9. Pericyclic Reactions (**C&S 6**, see also C&S Part A, Chapter 11) 4 lectures
 - a. Electrocyclic reactions
 - b. Sigmatropic rearrangements
 - c. Cycloadditions
 - d. Ene and retro-ene reactions

Final Exam Thurs, Dec 14, 2006, 12:30 pm – 2:30 pm